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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/670,601 | 09/26/2003 | Tomoo Satoh | Q77623 | 9902 |

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| EXAMINER |
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JAWORSKI, FRANCIS J

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| ART UNIT | PAPER NUMBER |
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3737

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|---------------------------------|-----------------------------|--|
| Office Action Summary | Application No. 10/670,601 | Applicant(s) SATO, TOMOO | |
| | Examiner Jaworski Francis J. | Art Unit 3737 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07052005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 –8 are again rejected under 35 U.S.C. 102(b) as being anticipated by any of the following ultrasound transducer array devices and claim 4 is also so rejected (save for Okada et al), where a connecting means in these devices is inherent and includes an electrode pin set (Claim 2) where a discrete connector is invoked, whereupon the identification information is used to affect delay or sensitivity and therefor the waveform via channel adjustment is made:

Tsuchiko et al (US5251631) probe connector element 30 and col. 5 lines 28 – 58 identifying channel sensitivity and phase calibration data,

Okada et al (US5657761) probe type and transmission power identifying signals A,B of Fig. 1.

Magrane (US4893284) PROM 16 storing channel time delay error compensation, Ikeda et al (US4811740) connector memory 2 storing delay and probe pitch curvature, focus and aperture information, see col. 5 lines 1 – 17.

Snyder et al (US6120449) elements 24, 36, 56-60 are on board the probe which feeds through the system connector and updates the flash memory 58 to bridge or short defective elements in a two-dimensional array in order to increase manufacturing yield,

see col. 2 lines 3 – 41. Snyder et al is a type of probe defective element re-optimization and therefore is the core art vis-à-vis applicant's actual problem solution.

As noted above, Okada et al is inapplicable against claim 4 since it is confined to amplitude/sensitivity not delay as a control. Snyder et al in particular entertains supplying channel-specific phase data to the beamformer, tantamount to delay control via the connecto ID, see col. 9 line 66 – col. 10 line 9.

In each instance the connectors are set up so that the connection to selected transducer elements is accomplished for different probes including for example in Ikeda et al for probes of fundamentally different type and in Snyder et al for different connections due to individual element failures in individual probes. (Claim 3).

In the instance of claim 3, whereas applicant is invoking the feature whereby a probe identifier assigned during manufacture testing of the probe for defects is used to locally invoke probe arrangement delay and connections-usable information in either a locally stored disc 28 or retrievable over a network (see spec page 22 line 12 – page 23 line 10) the broadest reasonable interpretation includes arrays or systems having configurable connectors to accommodate different probes. Hence:

Claim 3 is again rejected under 35 U.S.C. 102(b) or in the case of Brock-Fisher 102(e) as being anticipated by any of:

Uchiumi et al (US5092337) connector ID information acts on 13 to configure electrode connection via 4 based upon the type of probe used, see col. 1 line 6 – col. 2 line 27.

Brock-Fisher (US6500126) teaches adapter-connector 42 such that different and otherwise incompatible probes may be used interchangeably by systems of different manufacturers, see col. 2 lines 30 – 55.

Snyder (US5520187) differently configures a probe via its connector such that it may flexibly operate on different ultrasound systems, see col. 2 lines 48-65. Therefore literally the connector system is such that plural connection electrodes are set up for each probe and therefore for plural probes.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 – 3 are again further rejected under 35 U.S.C. 103(a) as being unpatentable over the above references, further in view of Briskin et al (US5209235). If applicant's literal short/open circuit system of specification page 9 line 15 – page 10 line 17 is entertained for claim interpretation in a narrow sense then it would have been obvious in view of Briskin et al to so binarize a digital identification circuit 26 as per Figs. 6A-6D and col. 3 line 66 – col. 4 line 6 in order to simplify the transfer of identification information without advanced logic to interpret same..

Claim 4 is again rejected under 35 U.S.C. 103(a) as being unpatentable over Snyder et al in view of Haider (US6565510). The former is applied as above, save that

in this instance it is narrowly construed that the aforementioned providance of phase information to the beamformer is not literally tantamount to delay amount control or to a computed re-optimization of delay based upon defective elements of the array. It would nonetheless have been obvious in view of Haider col. 8 lines 9 – 55 to re-optimize delay or individualize delay profiles based upon the presence of defective elements since Haider of GE is also interested in increasing the service usability of ultrasound imaging arrays, see col. 3 lines 14 – 37 and recognized that remote re-optimization was equivalent to local re-configuration of an earlier GE system such as Snyder et al, see col. 10 lines 57 – 63.

Claim 5-6 are again rejected under 35 U.S.C. 103(a) as being unpatentable over any of the references Tsuchiko et al, Snyder et al in view of Haider, Magrane as applied against claim 4 above, and further in view of Ikeda et al, or in the case of Ikeda et al as applied above, as obvious over Ikeda et al alone. In all instances since Ikeda et al notes col. 1 lines 29-46 that one may pre-store the entire body of channel delay information for a batch or population of probes for subsequent readout if one is willing to suffer the large memory requirement, it would have been obvious at the time of invention to consider such since memory subsequently became much cheaper and more flexibly transferable.

Response to Amendment Arguments

Applicants' amendatory limitation that the array pattern include an original pattern determined to be working and an additional reconfigured pattern of elements determined to be working is not deemed to represent patentable subject matter within

the environment claimed because all arrays involve the selective configuration of elements with many including additional elements later included in the energized subgroup which fires the individual scanline beams as they progress across the array face, see first cited Tsuchiko et al Col. 4 lines 11-37 as exemplary. Hence the amendatory language may refer simply to the programmed connection/disconnection of individual transducer elements during the progress of an imaging scan, all of the elements typically having been determined to be working since the array probe is presumed to be in a normal operating state.


THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 703-308-3061.

FJJ:fjj

09152005


Francis J. Jaworski
Primary Examiner